WORKING PAPER:

THE URBAN INSTITUTE
WASHINGTON, D.C.

3983-01 December 1990

USING A NEW TYPE-OF-SERVICE CLASSIFICATION SYSTEM TO EXAMINE THE GROWTH IN MEDICARE PHYSICIAN EXPENDITURES, 1985-1988

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Support for this research was provided by the Health Care Financing Administration to The Urban Institute through Cooperative Agreement No. 17-C-99473/3-01. This cooperative agreement supported a number of research projects related to the Medicare Volume Performance Standard Policy. The total budget for all of these projects was $449,419 and represents the sole source of funding.

The authors are particularly grateful for the advice and counsel of Joseph M. Giordano, M.D., Stanley M. Knoll, M.D., and L. Gregory Pawlson, M.D. Stephen Zuckerman also provided a large number of useful comments on drafts of this report. Any opinions expressed are those of the authors and do not reflect the opinions of the Health Care Financing Administration, The Urban Institute, or its sponsors.

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I. OVERVIEW

This paper describes the development of a new Medicare physician type of service classification system undertaken at The Urban Institute. The existing Medicare type of service system is relatively simple and not useful for analytic purposes. It divides services into medical care, surgery, consultations, diagnostic radiology, diagnostic laboratory, radiation therapy, assistants at surgery, anesthesiology, and a number of other minor categories of services. The major problem, as seen in Table 1, is that approximately 70 percent of all allowed charges are categorized into medical care and surgery. Medical care includes many diagnostic services as well as office and hospital visits. Surgery includes major as well as very minor surgical procedures; it also includes a wide range of endoscopy procedures. This classification system is particularly weak in contributing to analysis of the growth in Medicare expenditures. For example, as shown in Table 1, surgery grew at 12.7 percent per year; but this combines substantially faster growth in cardiovascular and eye surgery, and endoscopy procedures, with slower rates of growth for general and orthopedic surgery. Similarly, the annual rate of increase of 15.3 percent for diagnostic x-ray combines substantially faster rates of growth for newer, high technology radiology services with much slower rates of growth for routine x-rays.

The classification system that will be described below was developed under the direction of the co-authors of this paper together with a small group of practicing internists and surgeons. Individuals in other specialties have provided assistance in assigning specific services to the appropriate category

Table 1
Medicare Allowed Charges, 1985-1988
Current Type of Service Classification Systems

	1985 Allowed Charges	Percentage of All Allowed Charges (1985)	1988 Allowed Charges	Percentage of All Allowed Charges (1988)	Annual Percentage Growth, 1985-1988
Medical Care	$6,691.0	35.0%	$8,787.1	32.5%	9.40%
Surgery	6,231.6	32.6%	8,955.2	33.1%	12.71%
Consultations	637.4	3.3%	960.2	3.5%	14.47%
Diagnostic X-ray	1,801.6	9.4%	2,771.6	10.2%	15.26%
Diagnostic Lab	1,589.1	8.3%	2,727.6	10.1%	19.51%
Radiation Therapy	232.3	1.2%	372.5	1.4%	16.85%
Asst. Surgery	315.9	1.7%	329.2	1.2%	1.37%
Anesthesia	900.9	4.7%	1,126.7	4.2%	7.74%
Other	725.2	3.8%	1,044.7	3.9%	12.80%
All Services	$19,125.0	100.0%	$27,074.8	100.0%	12.28%

SOURCE: Tabulations from the 1985 and 1988 BMAD procedure files.

by clarifying the nature of certain procedures. These physicians were specialists from ophthalmology, radiology, neurology, allergy, gastroenterology, and urology.

The remainder of this paper describes how this classification system was constructed. Basically, we classified over 7,000 HCPCS procedures into a system of 21 types of services. These 21 categories can be collapsed into fewer groups if desirable. We also classified over 2,000 local codes into one of these 21 categories. We believe that the resulting classification system is useful for better understanding both the growth in physician services over time, as well as area variations in the use of these services. We then use this classification system to describe the growth in Medicare physician expenditures from 1985 through 1988.

Our objective was to design a classification system with the following characteristics:

- Completeness - covers all CPT codes with little recourse to a residual "other" category.
- Mutually exclusive categories - a code should belong to one, and only one, category.
- Clinically meaningful - i.e., readily understood clinical categories, not statistical or financial categories.
- Categories should permit objective assignment, even by nonexperts, of services to appropriate category.
- Stability over time.
- Relatively immune to minor changes in technology or practice patterns.

Having set out these criteria, the panel encountered practical limitations in achieving an ideal classification system. Most of the practical problems

derived from the nature of the CPT-4 (HCPCS) procedure coding system. Perhaps inevitably, a coding manual that includes over 7000 different services will contain inconsistencies. Some of the inconsistencies with CPT-4 and other problems we faced in categorizing codes include:

- Most diagnostic imaging services are listed under radiology, but not all. Indeed, recent editions of CPT-4 moved some imaging from radiology to elsewhere where it was grouped with other services performed by the same specialty, e.g., cardiac sonography.

- Most evaluation-management activities and services are in the 90000 series of codes, but not all. The evaluation and management services found elsewhere generally are grouped with other services in the same specialty, e.g., radiation therapy planning.

- The CPT-4 changes every year, sometimes not insignificantly. Some codes are converted to new codes, reflecting slight alterations in the procedure performed or the use of new technology to perform the procedure. Often, the equivalent, new code is found elsewhere in the CPT-4 scheme. Sometimes code definitions change so that there is no direct equivalent in subsequent years. Codes are often deleted completely with no new equivalent, while, naturally, new codes are generated representing new procedures.

- CPT-4 does not have completely mutually exclusive codes. That is, in certain cases, a physician may have an option of using different codes for the same service, e.g., heart sonogram or echocardiogram.

- Place of service, e.g., "in-hospital," is sometimes identified in the code definition. Usually it is not.

- A procedure performed "under anesthesia" is sometimes identified in the code definition. Usually it is not.

- Some evaluation and management services that require simple equipment to facilitate physician examination are identified in great detail with separate codes for certain specialties, e.g., neurology, ophthalmology. Evaluation and management services in other specialties that similarly require use of simple equipment, e.g., cardiac maneuvers using a stethoscope, are not separately identified. In other words, some specialties have had their evaluation and management services "unbundled" from ordinary visit codes, whereas most have not.

- Confusion relates to a single procedure where two or more physicians may or may not be involved. For example, many procedures may be performed either by a surgeon and radiologist working in tandem or by a radiologist working alone. Thus, CPT-4 has broken down what is often a single procedure into possible component parts, e.g., "complete procedure" or "supervision and interpretation only." The breakdown into component parts is done inconsistently throughout the coding scheme. Sometimes the procedure part of the complete service is an adjacent code to the supervision and interpretation part. Often, however, it is located in a separate section of the manual, sometimes referencing the accompanying service, sometimes not.

The practical impact of these CPT-4 limitations on setting up a classification system relates less to conceptualizing the scheme and more to specific problems with assignment of individual codes to the appropriate category. Essentially, the classification system we developed reorganizes CPT-4 coding from an organ system/specialty orientation to a nature-of-procedure orientation.

Our physician advisory panel rejected a number of classification groupings before agreeing on the one contained in Table 2. Briefly, the rejected categories included:

- Distinguishing surgeries from other procedures. Many physicians distinguish these two activities, i.e., surgery involves cutting tissue, other procedures do not. For many activities, however, the physicians thought that the distinction was arbitrary and not useful. Electrocautery of a skin lesion would be surgery. Freezing the same lesion would be a procedure. Second, many "procedures" would include "surgery," e.g., a colonoscopy with biopsy. Assignment of such an activity could violate the goal of mutually exclusive categories. Finally, neither CPT-4 nor HCFA in its assignment of ambulatory surgical services distinguished surgeries from procedures.

- Distinguishing diagnostic from therapeutic procedures. The appeal here was on policy grounds. For example, one could argue that physicians might respond differently in volume-generating behavior between diagnostic and therapeutic activities. In general, diagnostic procedures would be less risky and more discretionary and, perhaps, supportive of "defensive medicine" behavior, whereas therapeutic procedures would likely be subject to more legal and ethical sanctions and established peer review mechanisms. In other words, one might anticipate more volume generation in diagnostic than therapeutic services. This separation was rejected primarily because of the large overlaps between therapeutic and diagnostic procedures. Many physicians activities, and their corresponding codes, are simultaneously diagnostic and therapeutic. Assignment to one or the other was felt to be arbitrary and not clinically meaningful.

- Distinguishing routine from specialized tests. Here the goal was to separate the impact of new technology on testing, based on the assumption that routine tests have been performed by custom for many years by most physicians and might show volume stability whereas new, technology-driven tests might show increases. Candidates for "routine tests" included complete blood counts, blood sugar, electrocardiograms, chest X-ray,

urinalysis. However, the panel decided that the delineation of "routine tests" was not stable over time, that different specialties had different notions of what constitutes routine tests, and that we could separately analyze the volume changes in these tests without establishing the group as a category in the classification system.

The Classification System

Table 2 provides an overview of the classification system. Each of the categories is listed together with the unique HCPCS codes and allowed charges for each type of service in 1988. In general, the procedure codes include both modified and unmodified claims. The exception is that standard and advanced imaging were disaggregated into "professional component" and global procedures. Thus, the number of procedure codes for the classification system exceeds the number of HCPCS codes. The number of procedures will also exceed the number of HCPCS codes because we have assigned large numbers of local codes to our type of service system. Detailed data on the most important procedures in each category are provided in Tables 4 through 23.

1. The classification system has six evaluation and management service categories. In general, the evaluation and management service categories are reasonably clear-cut, and we experienced few problems with assignment of codes. In aggregate, evaluation and management services amount to about $9.1 billion or 33.7 percent of Medicare allowed charges in 1988. Categories are:

- Office visits
- Hospital visits
- Emergency room services
- Nursing home and home visits
- Specialty-specific evaluation and management services
- Consultations

Table 2

Urban Institute Type of Service Classification System
(Numbers of Procedure Codes and Allowed Charges, 1988)

	HCPCS Codes	Allowed Charges (in millions)	% of All Allowed Charges
Evaluation and Management Services			
Office Visits	54	$3,151.7	11.64%
Hospital Visits	39	3,105.5	11.47%
Emergency Room Services	21	327.9	1.21%
Nursing Home and Home	94	364.3	1.35%
Specialty Specific Eval. & Mgmt. Serv.	221	1,254.0	4.63%
Consultations	21	929.2	3.43%
Procedures			
Major Procedures			
Cardiovascular	474	1,475.6	5.45%
Orthopedic	647	853.4	3.15%
Other	1400	1,609.3	5.94%
Ambulatory Procedures			
Eye	208	2,386.7	8.82%
Other	1270	942.5	3.48%
Minor Procedures	992	821.2	3.03%
Oncology Services	171	454.8	1.68%
Endoscopy Procedures	380	1,228.8	4.54%
Dialysis Services	53	233.7	0.86%
Imaging			
Standard Imaging	1001	1,582.9	5.85%
Advanced Imaging	141	715.0	2.64%
Sonography	96	689.9	2.55%
Imaging/Procedure	259	512.0	1.89%
Tests			
Lab Tests	1510	1,425.8	5.27%
Other Tests	524	1,188.7	4.39%
Anesthesiology		1,126.7	4.16%
Other			
A-V HCPCS Codes (except M,P,R)		468.8	1.73%
W-Z Local Codes		66.9	0.25%
Other Unassigned		159.5	0.59%
	9,576	$27,074.8	100.00%

SOURCE: Tabulations from the 1985 and 1988 BMAD procedure files.

The first three categories are largely self-explanatory. Office visits account for $3.2 billion and hospital visits for $3.1 billion. We considered combining hospital visits and consultations because of frequent physician confusion over the distinction between initial visits and consultations. Because they are of such widespread interest, however, we decided to keep consultations a separate category. Emergency room services are separate even though they account for a relatively small amount of expenditures, because they are a unique kind of service in most instances. Also, including them with either hospital or office visits would inflate the chosen category inappropriately in relation to the other. While also representing a small amount of expenditures, nursing home and home visits are separated out because of the increasing interest in post-acute and long-term care.

Specialty-specific evaluation and management services represents a different category from customary visits or consultations. It includes specialty-specific evaluation and management services that are spread throughout the CPT-4 system. For the most part, these specialty-specific evaluation and management services are easily distinguishable from procedures and tests. In contrast to procedures and tests, the major professional contribution is the time and requisite expertise of the specialist. Specialty-specific evaluation and management services might have been assigned to office visits, hospital visits or consultations. They are categorized separately because the services performed are specific to a unique specialty, whereas codes for office visits, hospital visits and consultations are used by all specialties. The most important such services, as can be seen in Table 8, include ophthalmology services, medical psychotherapy, and surgical pathology services. These specialty-specific evaluation and management services amounted to about $1.3 billion in 1988.

2. The classification system has a set of six procedure types. In 1988 these procedures accounted for $10 billion, or 37 percent of Medicare allowed charges. For analysis purposes we also subdivided two of the categories. The categories and subcategories include:

- o Major procedures
  - — cardiovascular procedures
  - — orthopedic procedures
  - — other major procedures
- o Ambulatory procedures
  - — eye procedures
  - — other ambulatory procedures
- o Minor procedures
- o Endoscopy and arthroscopy procedures
- o Oncology services
- o Dialysis services

Major procedures almost always take place in the hospital; usually, but not always, require anesthesia or anesthesia standby; and/or involve significant risk to the patient. They are predominantly surgical procedures that are not on HCFA's ambulatory surgery list. We divided the group into the financially most dominant categories: cardiovascular ($1,475.6 million), orthopedic ($853.4 million), and other ($1,609.3 million). Medicare's most commonly performed major procedures include transurethral resection of the prostate, arthroplasty of the hip and knee, closed and open femoral fractures, coronary artery bypass grafts, thromboendarterectomy, colectomy, cholecystectomy, and modified radical mastectomy.

Ambulatory procedures are those that usually can be done in an ambulatory care center setting, as identified by HCFA, and which are not routinely performed in physicians' offices. To the HCFA list a few additional procedures were added: those nonsurgical procedures that are performed in a specialized

outpatient center that provides highly technical equipment and specialized staff devoted to the provision of the particular service. Examples include eye laser therapy and lithotripsy. Also, certain procedures which otherwise would be considered minor procedures were included as ambulatory because the CPT-4 definition included "under anesthesia." On the other hand, procedures on the HCFA ambulatory surgery list which our analysis revealed to be performed 90 percent of the time in inpatient settings in 1988, were reclassified as major procedures. Ambulatory procedures were divided into eye ($2,386.7 million) and other ($942.5 million). The most important ambulatory eye procedures include extracapsular cataract removal with lens implants, and discission of secondary membranous cataracts by laser surgery. The most important "other" ambulatory procedures were hernia repairs and excisions of malignant lesions.

We chose to include a category for endoscopy procedures primarily because of the recent proliferation of fiber optic instruments and corresponding increase in use of this technology. CPT-4 categorizes endoscopies separately, making assignment easy. Most endoscopies are performed in specialized outpatient settings using dedicated personnel, regardless of whether the patient is an inpatient or not; thus, endoscopies are akin to ambulatory surgery and for some analytical purposes can be added to the ambulatory surgery list. (Exceptions include proctosigmoidoscopy which is generally performed in a physician's office.) Nevertheless, because endoscopies represent $1.2 billion of services, we chose to include them as a separate category. Most commonly performed endoscopies include upper G.I. endoscopies, colonoscopies, proctosigmoidoscopies, cystourethroscopies, and bronchoscopies.

The minor procedures category includes services that are generally done in physicians' offices by physicians, but also include procedures performed by nonphysicians under the supervision of physicians, e.g., immunizations and

injections. (The group considered a category of "minor therapies" but rejected the designation as fiscally too trivial.) Certain minor procedures are also performed in the hospital with significant frequency because, while the services involve minimal risk, skill, etc., they are used in treating patients who are hospitalized. Common minor procedures include skin biopsies, incision and drainage of abscesses, destruction of benign lesions, and arthrocentesis.

Oncology and dialysis procedures are two sets of services which would be inappropriately classified elsewhere. The procedures are provided by specialists, performed repetitively on patients with chronic conditions, and involve risk and the use of specialized technology and dedicated staff. However, in contrast to ambulatory or major procedures, they do not require continuous physician attendance. Rather, the procedures are performed under physician direction, and the physician may be called upon to intervene during the course of the procedure to address a problem that may have arisen. Oncology services include radiation therapy and chemotherapy. Dialysis services include all hemodialysis services, including monthly capitation payments for dialysis services. In 1988, oncology services amounted to $454.8 million, while dialysis services amounted to $233.1 million. Analysis of the latter revealed large amounts of underreporting of dialysis services; thus this figure understates Medicare spending on dialysis and all further analysis presented in this paper will exclude this category.

3. We have altered the CPT-4 designation of radiology services somewhat. Our interest focuses on the ultimate purpose of the imaging procedure. That is, is radiology performed to facilitate performance of a procedure, e.g., fluoroscopy? Or is a procedure performed to produce a permanent image which is then interpreted, e.g., coronary angiography. We believe that our concept is a cleaner distinction and corrects some anomalies in CPT-4. For example, in CPT-

4, all angiography except coronary angiography is included under radiology. There seems to be no valid or useful reason for the distinction. Likewise, interventional radiology uses fluoroscopy and is performed by a radiologist, but in all other aspects is similar to a major procedure, i.e., risk, skill, purpose of intervention, etc. Our focus then is on the nature of the activity, not, as in CPT-4, on whether the activity is performed commonly by a radiologist.

Our approach, nevertheless, presents some problems. Specifically, certain procedures are performed for multiple purposes, including obtaining a permanent image for interpretation. We had to judge whether the primary purpose of the activity generally is to obtain an image or not. The result is that left heart catheterization with angiography was assigned to imaging, whereas right heart catheterization, usually performed to obtain and monitor pressure readings, was assigned to major procedures. Similarly, we have assigned echocardiography to imaging even though it is not included under radiology in CPT-4 because our focus was on the nature of the activity, not on the physician commonly performing the service.

Our imaging categories, then, are as follows:

- Standard imaging (includes nuclear medicine)
- Advanced imaging--CTs and MRIs
- Sonographic imaging
- Imaging involving a significant procedure

These services accounted for $3.5 billion in 1988, or 12.9 percent of Medicare allowed charges.

Designation of advanced imaging and sonographic imaging was straightforward--the procedures were assigned "by definition." There was some discretion in determining whether an imaging procedure should be deemed

standard or one involving a significant procedure, i.e., involving unusual risk and skill. We did not have a group of radiologists available to us formally to help in the assignment of these procedures. Nevertheless, for the most part, the assignments were straightforward. Most common standard imaging procedures ($1,582.9 million) include plain X-ray exams of the chest, spine, hip, knee, and foot, and barium studies of the upper and lower G.I. tract. Advanced imaging ($715.0 million) consists solely of computerized axial tomography (CT) scans and magnetic resonance imaging (MRI) procedures. Most common sonography services ($689.9 million) were echocardiography and ophthalmic sonograms. Imaging with a major procedure ($512.0 million) includes right and left heart catheterizations, left heart catheterizations, and other angiography and venography procedures.

4. The next major category of services is commonly designated as tests. We chose two subcategories:

- Laboratory tests
- Non-laboratory tests

Tests accounted for $2.6 billion in 1988, or 9.6 percent of Medicare allowed charges.

Laboratory tests ($1.4 billion) are quite straightforward and are drawn mostly from the Pathology section of CPT-4 (a few are found elsewhere). The most important were automated multichannel tests, urinalysis, glucose, and complete blood counts.

The category of non-laboratory tests ($1.2 billion) raises a small problem in the distinction between tests and minor procedures. In general, we deem an activity a test if the physician's main involvement is interpretation rather than performance of a test. A prototypical test is an electrocardiogram where a technician commonly uses a machine to obtain a tracing from a patient, and

the physician interprets the tracing as a separate activity, often when the patient is not present. Certain activities involve some direct physician involvement with the patient and/or the equipment. The amount and intensity of that involvement determines whether the activity is designated a test or a procedure, usually minor procedure. Again, a panel of experts drawn from specific specialties might disagree with some of the designations, but for the most part, the line between a test and a procedure is clear-cut.

Occasionally, there was a boundary problem between a non-laboratory test and an evaluation and management service. For example, certain ophthalmological and neurological activities involve use of minor equipment to obtain a reading or a specific observation. Depending on who uses the equipment, i.e., the physician or the technician, and whether the result is a more precise examination, or a calculation or graphic representation or both, the service might be considered a test or, alternatively, an evaluation and management service of a specialist. Again, there may be disagreement about some of these designations. The most common non-laboratory tests include electrocardiograms, audiometry, spirometry, nerve conduction studies, and noninvasive studies of the carotid arteries.

There are three residual categories. The first is nonphysician services sometimes provided by physicians. This includes medical supplies, drugs, and orthopedic devices that are directly provided by physicians; that is, it includes physicians billings for the HCFA alpha codes A through V (except for M,P,R and some Q codes). Another category is carrier or local codes. These are codes that describe physician or nonphysician services that we were unable to classify into our type of service classification system. The final category is a set of unassignable categories. These include procedures whose definitions were too vague to permit categorization. For example, CPT-4

permits physicians to use codes for unlisted procedures. Finally, anesthesiology is considered a separate type of service.

II. GROWTH IN MEDICARE ALLOWED CHARGES FOR PHYSICIAN SERVICES, 1985-1988

Next we examine growth in allowed charges for physician services using the type of service system that we have described above. As can be seen in Table 3, Medicare allowed charges for physician services have grown from $19 billion in 1985 to $27 billion in 1988. This represents an annual growth rate of about 12 percent per year. Approximately 2 percent of this growth is due to the annual growth in Medicare enrollment. Another approximately 4 percent per year is due to increases in Medicare fees. Thus any growth in allowed charges in excess of about 6 percent per year represents real growth. Future research in this project will more precisely measure price change and allow us to more accurately account for changes in volume and intensity.

The purpose of the remainder of this paper is to provide a broad overview of the growth in Medicare allowed charges by categories of service. There are a number of important findings that can be gained from examination of Table 3. The first is that office and hospital visits, while accounting of a large proportion of Medicare dollars, have not been growing at particularly rapid rates. This is especially true for hospital visits. On the other hand, there has been a fairly rapid growth in allowed charges for emergency room services (21.3 percent per year). Allowed charges for specialty-specific evaluation and management services have also grown at about 22 percent per year. This is largely due to increases in ophthalmological examinations and surgical pathology. Consultations increased at annual rates of 12.4 percent per year while home and nursing home visits increased at 11.3 percent per year.

Table 3
Medicare Allowed Charges for Physician Services
(1985–1988)

Type of Service	1985 Allowed Charges (in millions)	1988 Allowed Charges (in millions)	Average Annual Growth Rate
Evaluation and Management Services			
Office Visits	$2,302.9	$3,151.7	11.03%
Hospital Visits	2,535.1	3,105.5	7.00%
Emergency Room Services	183.6	327.9	21.33%
Nursing Home and Home	264.5	364.3	11.26%
Specialty Specific Eval. & Mgmt. Serv.	691.6	1,254.0	21.94%
Consultations	654.3	929.2	12.40%
Procedures			
Major Procedures			
Cardiovascular	1,008.3	1,475.6	13.53%
Orthopedic	667.2	853.4	8.55%
Other	1,334.8	1,609.3	6.43%
Ambulatory Procedures			
Eye	1,509.5	2,386.7	16.50%
Other	692.5	942.5	10.82%
Minor Procedures	517.9	821.2	16.61%
Oncology Services	287.2	454.8	16.56%
Endoscopy Procedures	759.5	1,228.8	17.40%
Dialysis Services	147.1	233.7	16.69%
Imaging			
Standard Imaging	1,158.2	1,582.9	10.97%
Advanced Imaging	309.8	715.0	32.15%
Sonography	356.3	689.9	24.64%
Imaging/Procedure	311.3	512.0	18.04%
Tests			
Lab Tests	875.5	1,425.8	17.65%
Other Tests	767.5	1,188.7	15.70%
Anesthesiology	900.9	1,126.7	7.74%
Other			
A–V HCFA Codes (except M,P,R)	587.7	468.8	-7.26%
W–Z Local Codes	110.4	66.9	-15.38%
Other Unassigned	191.6	159.5	-5.93%
All Physician Services	$19,125.2	$27,074.8	12.28%

(3983tab2.mbd)

SOURCE: Tabulations from the 1985 and 1988 BMAD procedure files.

It is also of interest to note that most major surgical procedures did not experience much of an increase during this period. A major exception is cardiovascular surgery, which increased at almost 14 percent per year. Allowed charges for orthopedic and other surgery increased at rates that approximated the increase in enrollment and Medicare reimbursement rates. Another major exception to the relatively flat rate of growth in major procedures is the rapid increase in ambulatory eye procedures, which increased at 16.5 percent per year. Other ambulatory procedures increased at only 10.8 percent per year.

Other types of procedures experienced much more rapid increases. Minor procedures, largely office based procedures, increased at 16.6 percent per year. Oncology services also increased at 16.6 percent; endoscopy procedures increased at 17.4 percent. As noted earlier, information on dialysis is widely underreported and the growth rate of 16.7 percent shown in Table 3 could be due to either true increases in the use of dialysis services or to better reporting of data in 1988 compared to 1985.

The next categories of services are various types of imaging. Allowed charges for standard imaging, primarily routine x-rays, increased at only 11 percent per year. Advanced imaging charges increased by 32.2 percent per year while sonographic imaging increased by 24.6 percent per year. Imaging as part of a significant procedure increased at 18.1 percent per year. The use of tests, both laboratory and other, also contributed to rapid growth during this period; allowed charges for the former increased by 17.7 percent per year and the latter by 15.7 percent.

Charges by physicians for nonphysician services declined during this period. Similarly, the use of local codes also declined as carriers became increasingly able to use HCPCS codes. Finally the number of unclassifiable codes declined. There was growth in allowed charges for anesthesia of about 8

percent per year, roughly the growth rate for allowed charges for major surgical procedures.

III. DISAGGREGATED ANALYSIS BY TYPE OF SERVICE

In this section we examine the major procedures that are included in each of the type of service categories described above. Tables 4 through 23 provide information on charges in 1985 and 1988 as well as annual growth rates for all procedures that met the following criteria: the procedure had to account for at least 1.5 percent of the charges in the type of service category in any one year between 1985 and 1988. This would allow us to identify procedures that were gaining or losing importance as well as to identify important new procedure codes along with those codes that were being replaced.

Office Visits

Table 4 provides information on the growth in services and charges for various office visit codes. The most important finding is that while allowed charges for office visits increased by only 11.0 percent, there was apparent evidence of up-coding or procedure coding creep. For example, physicians can use a range of codes in billing for office visits to established patients. The codes include brief limited, intermediate, extended, and comprehensive. During this period, the number of services and allowed charges for the code with the lowest Medicare reimbursement rate, the brief office visit, declined by about 8 and 5 percent per year, respectively. In contrast, the number of limited office visits increased by 4 percent, intermediate office visits by 10.9 percent, and extended visits by 13.2 percent, while allowed charges for these codes increased by 8.2 percent, 16.7 percent, and 19.8 percent, respectively. Other than the most expensive procedure, the comprehensive visit, there was a

clear, linear increase in the use of more expensive codes. The same is true for new patient visits. The least growth in allowed charges was for limited new patient visits (the number of visits declined); the most growth was for comprehensive new patient visits.

Hospital Visits

Table 5 provides information on the most important hospital visit codes. A similar finding of procedure coding creep is also apparent. Among subsequent hospital visits, brief visits declined annually by 15.0 percent per year, and limited services by 4.6 percent; in contrast, intermediate services increased each year by 5.8 percent, extended visits by 7.7 percent, and comprehensive visits by 8.9 percent. As a result, while hospital visits in total increased by less than 1 percent per year, allowed charges increased by 7 percent. While some of the increase in the latter was due to increases in reimbursement rates, there was a clear shift toward use of more highly reimbursed codes. There were also fairly large increases in the number of critical care services.

Emergency Room Services

The growth in emergency room services is shown in Table 6. The number of emergency room services increased by about 11.5 percent per year, while allowed charges increased by 21.3 percent per year. Here again, there is evidence of substantial upcoding. The lowest emergency room code, minimal visits by new patients, declined by 12 percent per year and brief and limited visits increased by only 2.9 percent and 4.3 percent, respectively. In contrast, intermediate visits increased by 13.8 percent and extended visits by 13.3 percent per year. Allowed charges for intermediate and extended visits increased by 17.4 percent and 20.6 percent, respectively. Moreover, comprehensive visits accounted for over $50 million in 1988, while there were

no allowed charges for that procedure code in 1985. A similar pattern of upcoding is present for emergency room services provided to established patients.

Home and Nursing Home Visits

Table 7 provides information on home and nursing home visits. The number of nursing home and home visits increased at moderate rates, about 5.8 percent per year, while allowed charges increased at annual rates of 11.3 percent. This, in part, reflects a significant amount of upcoding. For subsequent visits to nursing home patients, the number of brief visits increased by 0.2 percent; limited visits, by 5.7 percent; intermediate visits, by 17.4 percent; and extended visits by 13 percent. The findings for home visits are slightly different. Overall, the number of home visits declined; however, extended visits increased slightly. The result is that allowed charges for limited and brief home visits declined while allowed charges for intermediate and extended home visits increased.

Specialty-Specific Evaluation and Management Services

This category is dominated by ophthalmological exams, psychotherapy, and surgical pathology. As shown in Table 8, the number of services increased by 14.3 percent and allowed charges increased by 21.9 percent per year. There were annual increases of more than 20 percent in each of the ophthalmological visit codes with one exception—intermediate ophthalmological exams of new patients. Ophthalmoscopy procedures also increased at rates in excess of 16 percent per year, while allowed charges increased by more than 20 percent in each case. Ophthalmological visual field exams with a medical diagnostic evaluation increased at 63.9 percent per year during this period; allowed charges increased by 87.9 percent. Allowed charges for most surgical pathology

services increased by about 20 percent per year. Allowed charges for individual medical psychotherapy codes also increased at double digit rates with the exception of psychotherapy visits under thirty minutes; much of this seems to be due to rate increases. Ventilation assistance and management also increased dramatically during this period.

Consultations

The number of consultations in the aggregate increased by about 7.2 percent per year and allowed charges by 12.4 percent, as shown in Table 9. Again, the same pattern of upcoding was in evidence. The lowest reimbursed procedure, limited consultations, declined by 7 percent per year. The highest paying procedure, the complex consultation, increased by 12.4 percent.

Major Procedure, Other

Table 10 shows that, by far, the most important procedure in this category is the transurethral resection of the prostate. It accounted for $255 million in allowed charges in 1988. However, the number of procedures increased by only 1.2 percent per year, while Medicare charges increased by only 3.6 percent per year. All of the major procedures in this category exhibited relatively small growth rates. An exception was modified radical mastectomies, which increased by 10.9 percent. An important eye procedure, the discission of secondary membranous cataracts using an incisional technique (Ziegler or Wheeler knife), declined sharply, essentially because it was replaced by an ambulatory procedure using laser surgery.

Major Procedure, Cardiovascular

Table 11 demonstrates that this category is dominated by growth in coronary artery bypass grafts, pacemaker insertions, and coronary angioplasty.

Coronary artery bypass graft procedures (CABGs), ranging from 2 to 5 coronary grafts, increased at annual rates of from 10.5 percent to 15.1 percent per year. Allowed charges for CABGs increased by annual rates of from 16.1 percent to 18.7 percent. Pacemaker insertions also increased significantly, with the exception of one procedure code. The number of coronary angioplasties grew sharply during this period, increasing from 21 thousand to 67 thousand. Allowed charges for coronary angioplasties increased from $17.7 million in 1985 to $99.2 million in 1988, an average annual growth rate of over 77 percent. The number of carotid endarterectomies declined by 8.3 percent per year during this period, presumably due to increasing concern over efficacy.

Major Procedure, Orthopedic

This category consists largely of hip and knee replacements and repairs of fractures. The number of orthopedic procedures increased by 5.3 percent and allowed charges by 8.6 percent. Table 12 shows that knee replacements increased at annual rates of 16.4 percent during this period. There was a change in the use of hip procedure codes; thus some declined and others increased. In general, there does not seem to have been significant increases in hip procedures.

Ambulatory Procedures, Other

This category consists largely of hernia repairs, excisions of malignant lesions and other miscellaneous procedures. Table 13 shows that few of these procedures increased at rapid rates. An exception was excisions of breast cysts which increased at annual rates of 22.6 percent. Another important exception is the growth in the use of extracorporeal shock wave lithotripsy, which was insignificant in 1985 but increased to 19.1 thousand services and $18.0 million in allowed charges in 1988.

Ambulatory Procedures, Eye

This is one of the most rapidly growing and changing categories in Medicare, with a 20.9 percent increase in services and a 16.5 percent increase in allowed charges. Table 14 shows that this period saw continued growth in the use of the extracapsular cataract removal with lens insertion procedure. This procedure increased from 421.3 thousand in 1985 to 983.7 thousand in 1988, while allowed charges increased from $673.2 million in 1985 to $1.5 billion in 1988, a 31.5 percent annual increase. Not all of this represented a net increase in cataract removal and/or lens implants; other procedures which this technology replaced showed declines. Several other eye surgical procedures increased dramatically in importance. For example, allowed charges for trabeculoplasty by laser surgery, increased from $23.6 million in 1985 to $78.5 million in 1988, a 49.4 percent annual rate of growth. Finally, the discission of secondary membranous cataracts by laser surgery increased from 9.4 in 1985 to 374.6 in 1988, with allowed charges increasing from $4.5 million in 1985 to $192.2 million in 1988. This procedure replaced the inpatient procedure mentioned earlier.

Minor Procedures

This category includes a large number of relatively inexpensive, largely dermatological office-based, procedures. As shown in Table 15, the most important are arthrocentesis, destructions of benign lesions, skin biopsies, debridement of nails, and incisions and drainage of abscesses. Most of these procedures had rates of growth of almost 10 percent per year, with annual increases in allowed charges in excess of 10 percent.

Oncology Services

This category consists largely of radiation therapy and chemotherapy. The number of services increased by only 4.8 percent, but allowed charges grew by 16.6 percent, suggesting a shift to more expensive procedures. Table 16 shows that the most important procedures in terms of Medicare expenditures were daily radiation treatment management and therapeutic radiology treatment planning. In both cases there was again evidence of upcoding. The most rapid growth was in allowed charges for the complex procedure code; allowed charges for the simple procedure code either remained stable or declined. There was also a large increase in billings for weekly radiation treatment management.

Endoscopy Procedures

Table 17 provides information on growth in allowed charges for a wide range of endoscopy procedures, including upper GI endoscopies, colonoscopies, proctosigmoidoscopies, bronchoscopies, and cystourethroscopies. Upper GI endoscopies increased at approximately 13 to 15 percent per year. Colonoscopies increased at more rapid rates. The three main colonoscopy codes for procedures beyond the splenic flexure increased at rates of from 22.3 to 26.2 percent per year. The number of fiberoptic sigmoidoscopies also increased by 29.2 percent per year, with allowed charges increasing by 36.7 percent per year. Knee arthroscopies are also included in this category, and grew from 8.8 thousand in 1985 to 25 thousand in 1988. Allowed charges increased from $7.9 million in 1985 to $25.2 million in 1988, an annual rate of growth of 47.4 percent.

Standard Imaging

Standard imaging consists of routine x-rays as well as nuclear medicine exams. Table 18 shows that most of these procedures increased at annual rates

well under 10 percent per year. Overall, the number of standard imaging procedures increased by only 5.3 percent per year. Major exceptions were the two mammography codes, both professional component and the global procedure; the number of billings for the global procedure increased by 51.1 percent and for the professional component by 39.8 percent. Allowed charges increased by 55.9 and 45.2 percent, respectively.

Advanced Imaging

This category was the fastest growing type of service of all the categories. Table 19 shows that the increase in the most frequently performed CT scan procedures was almost 20 percent per year. Magnetic resonance imaging (MRI), which was virtually nonexistent in Medicare in 1985, was very important by 1988. Magnetic resonance imaging of the head accounted for $61 million in 1988. Magnetic resonance imaging of the spinal canal accounted for approximately $40 million by 1988. The rapid growth in CAT scans during this period suggests that the increases in MRIs have not been a substitute but an additional diagnostic procedure.

Sonographic Imaging

This category includes a large number of different types of procedures using ultrasound techniques. As shown in Table 20, non-invasive imaging of the carotid arteries grew by 27.7 percent per year during this period, with allowed charges increasing from $37.8 million in 1985 to $87.8 million in 1988. There was also fairly rapid growth for several echocardiographic procedures. On the other hand, some declined, apparently replaced by Doppler echocardiograph procedures. Doppler echocardiograph procedures increased from slightly more than 16.6 thousand in 1985 to 623.8 thousand in 1988, with allowed charges increasing from slightly more than $1 million in 1985 to $47.9 million in 1988.

The use of ultrasound echography by ophthalmologists also increased dramatically.

Imaging Involving a Significant Procedure

This category includes cardiac catheterizations, aortographies, and venographies. Table 21 shows that most of the growth in this area is accounted for by increases in cardiac catheterization. The two most important cardiac catheterization codes increased from 196.8 thousand in 1985 to 349.8 thousand in 1988. Allowed charges for these two cardiac catheterization codes increased from $130 million in 1985 to $270 million in 1988.

Laboratory Tests

Laboratory tests in general grew at annual rates of 15.4 percent per year, as shown in Table 22. Allowed charges for lab tests grew by 17.7 percent per year. Some routine laboratory tests, such as urinalyses, glucose, and potassium, did not experience particularly rapid growth. Important exceptions were complete blood counts and cholesterol tests. The two major cholesterol tests increased from 623 thousand in 1985 to 5.1 million in 1988. Specimen collection also experienced a rapid growth in billings, increasing by 88.5 percent per year. This is largely attributable to regulations eliminating direct billing for laboratory services. Physicians now bill for collection and handling but not for the laboratory service itself.

Other Tests

Other tests include electrocardiograms, electrocardiograph monitoring for up to 24 hours, and non-invasive tests of the lower extremity arteries. Table 23 shows that allowed charges for this type of service grew by annual rates of 15.7 percent per year. There was a major change in the use of different

year. There was a major change in the use of different procedure codes for electrocardiograph monitoring during this period. There appears to have been an increased use of new HCFA codes for electrocardiograph monitoring for 24 hours; these codes were non-existent in 1985 but accounted for $103 million in 1988. Two other electrocardiograph monitoring codes that were highly important in 1985 were no longer used by 1988. Non-invasive studies of the lower extremity arteries increased by 25.8 percent per year during the period. The two major cardiovascular stress tests also increased from 570 thousand in 1985 to over 1.0 million in 1988.

IV. CONCLUSION

This paper has described a new system for classifying Medicare services. Using this classification system, we showed that evaluation and management services accounted for 33.7 percent of Medicare allowed charges in 1988. Procedures, imaging services, and tests accounted for most of the remainder. We then used this classification system to describe and analyze the growth in Medicare expenditures over the 1985-1988 period. Medicare expenditures increased by an average annual rate of 12.2 percent per year over this period. About 4 percent per year was due to increases in prices. Approximately another 2 percent was due to increases in enrollment. The remainder (about 6 percent per year) was due to real growth in volume and intensity of Medicare services. Subsequent research will disaggregate the growth and expenditures more precisely into changes in volume and intensity.

The major conclusion from the analysis undertaken here is that the most important reasons for the growth in Medicare expenditures over this period were dramatic increases in various diagnostic procedures and tests. These included substantial increases in expenditures for endoscopy procedures (17.4 percent),

including increases of about 30 percent per year in colonoscopies. Imaging procedures increased at even faster rates. There were increases in expenditures for CT scans and MRIs of 32.2 percent per year. This increase was due to both growth in the number of advanced imaging exams as well as particular expansion of the use of more expensive MRIs. Sonographic imaging, particularly echocardiography, and cardiac catheterizations also increased at extremely rapid rates. Various kinds of tests also increased dramatically. Electrocardiograph monitoring and various cardiovascular stress tests showed substantial increases. Some kinds of laboratory tests increased significantly, the most dramatic being tests for cholesterol levels.

Increases in many kinds of surgery did not contribute much to the growth in Medicare expenditures. The major exceptions were cardiovascular surgery, particularly coronary artery bypass grafts and coronary angioplasty, and eye surgery, particularly cataract removals with lens implants. Many minor procedures, mostly dermatological, and oncology services also contributed to high Medicare growth rates during this period. Most major general and orthopedic surgical procedures did not increase significantly. Because these surgical procedures did not increase in a significant way, expenditures for anesthesia services also increased at relatively slow rates.

With some important exceptions, medical services were not major contributors to the growth in Medicare expenditures. For example, the number of office and hospital visits increased at annual rates of only 4.9 and 1.0 percent, respectively. The major exception was emergency room services where expenditures increased by more than 20 percent per year. In addition, allowed charges for specialty-specific evaluation and management services, particularly ophthalmological exams and surgical pathology, increased at rates of over 20 percent per year. The other noteworthy finding was an increase in upcoding in

all of the medical care categories. There were consistently greater increases for more expensive visit codes than for less expensive visit codes.

In conclusion, the growth in Medicare expenditures is not due to large increases in contacts with physicians or to increases in general or orthopedic surgery. Rather the increases were due to dramatic increases in the use of a wide variety of diagnostic procedures and tests, as well as to increases in cardiac and eye surgery. The use of new, highly sophisticated imaging techniques also contributed in a major way to the growth in Medicare expenditures. Finally, there was evidence of widespread substitution of higher- for lower-paying visit codes.

Table 4
Growth in Services and Allowed Charges for Individual Procedures, by Type of Service, 1985-1988
Office Visits

HCPCS	Description	1985 Total Allowed Services (in millions)	1988 Total Allowed Services (in millions)	Average Annual Growth	1985 Total Allowed Charges (in millions)	1988 Total Allowed Charges (in millions)	Average Annual Growth
90060	Office medical service, established patient; intermediate service	31.5	42.9	10.88%	$707.3	$1,123.5	16.68%
90050	Office medical service, established patient; limited service	37.9	42.7	3.97%	701.8	888.8	8.19%
90040	Office medical service, established patient; brief service	15.3	11.8	-8.30%	238.4	205.3	-4.86%
90070	Office medical service, established patient; extended service	6.2	9.0	13.17%	178.9	307.9	19.84%
90080	Office medical service, established patient; comprehensive service	3.6	4.2	5.20%	150.9	208.1	11.31%
90020	Office medical service, new patient; comprehensive service	2.7	3.1	4.01%	126.9	179.3	12.21%
90015	Office medical service, new patient; intermediate service	2.2	2.4	3.74%	66.7	86.5	9.04%
90010	Office medical service, new patient; limited service	1.8	1.6	-4.53%	43.7	47.0	2.41%
	Other Office Visits	4.5	4.5	0.39%	88.3	105.4	6.07%
	All Office Visits	105.7	122.1	4.93%	2302.9	3151.7	11.03%

SOURCE: Tabulations from the 1985 and 1988 BMAD procedure files.

Table 5
Growth in Services and Allowed Charges for Individual Procedures, by Type of Service, 1985-1988
Hospital Visits

HCPCS	Description	1985 Total Allowed Services (in millions)	1988 Total Allowed Services (in millions)	Average Annual Growth	1985 Total Allowed Charges (in millions)	1988 Total Allowed Charges (in millions)	Average Annual Growth
90260	Subsequent hospital care, each day; hospital subsequent care requiring intermediate services	25.0	29.5	5.78%	$688.3	$899.6	9.33%
90250	Subsequent hospital care, each day; hospital subsequent care requiring limited services	25.5	22.2	-4.55%	575.6	575.1	-0.03%
90220	Initial hospital care; comprehensive history and examination, initiation of diagnostic and treatment programs, and preparation of hospital records	5.5	5.5	0.11%	357.2	435.2	6.81%
90240	Subsequent hospital care, each day; hospital subsequent care requiring brief services	11.2	6.9	-15.02%	209.1	141.8	-12.14%
90270	Subsequent hospital care, each day; hospital subsequent care requiring extended services	5.5	6.9	7.73%	189.6	277.3	13.51%
90215	Initial hospital care; intermediate history and examination, initiation of diagnostic and treatment programs, and preparation of hospital records	2.0	1.7	-4.63%	108.2	106.7	-0.48%
90280	Subsequent hospital care, each day; hospital subsequent care requiring comprehensive services	1.9	2.4	8.94%	67.0	105.4	16.31%
99160	Critical care, initial, including the diagnostic and therapeutic services and direction of care of the critically ill or multiple injured or comatose patient, requiring the prolonged presence of the physician; each hour	1.0	1.0	1.13%	64.9	89.7	11.42%
99173	Critical care, subsequent follow-up visit; intermediate examination, evaluation and/or treatment, same or new illness	1.3	2.4	22.06%	53.7	120.0	30.75%
90292	Hospital discharge day management	1.8	3.0	18.68%	51.6	106.7	27.36%
99174	Critical care, subsequent follow-up visit; extended re-examination, re-evaluation and/or treatment, same or new illness	0.9	1.3	13.67%	42.7	75.9	21.16%
99172	Critical care, subsequent follow up visit; limited examination, evaluation and/or treatment, same or new illness	0.7	1.1	16.13%	26.5	49.8	23.43%
	Other Hospital Visits	2.6	3.0	5.35%	100.6	122.3	6.72%
	All Hospital Visits	84.9	87.0	0.85%	2535.1	3105.5	7.00%

SOURCE: Tabulations from the 1985 and 1988 BMAD procedure files.

Table 6
Growth in Services and Allowed Charges for Individual Procedures, by Type of Service, 1985-1988
Emergency Room Services

HCPCS	Description	1985 Total Allowed Services (in thousands)	1988 Total Allowed Services (in thousands)	Average Annual Growth	1985 Total Allowed Charges (in millions)	1988 Total Allowed Charges (in millions)	Average Annual Growth
90515	Emergency department service, new patient; intermediate service	1504.7	2214.8	13.75%	$51.7	$83.7	17.44%
90517	Emergency department service, new patient; extended service	1076.5	1566.7	13.33%	48.2	84.7	20.62%
90510	Emergency department service, new patient; limited service	1387.0	1572.0	4.26%	34.0	39.9	5.48%
90505	Emergency department service, new patient; brief service	548.9	597.4	2.86%	10.5	11.4	2.93%
90560	Emergency department service, established patient; intermediate service	486.3	583.6	6.27%	10.2	14.6	12.49%
90550	Emergency department service, established patient; limited service	425.6	495.0	5.17%	8.0	9.7	6.71%
90570	Emergency department service, established patient; extended service	221.4	314.3	12.40%	6.7	11.0	18.04%
90500	Emergency department service, new patient; minimal service	197.3	134.7	-11.95%	3.3	2.1	-14.56%
90540	Emergency department service, established patient; brief service	202.7	209.5	1.12%	2.8	3.5	7.18%
90520	Emergency department service, new patient; comprehensive service		707.7			52.5	
	Other ER Services	405.8	542.8	10.18%	8.2	14.9	22.04%
	All ER Services	6456.1	8938.6	11.46%	183.6	327.9	21.33%

SOURCE: Tabulations from the 1985 and 1988 BMAD procedure files.

Table 7
Growth in Services and Allowed Charges for Individual Procedures, by Type of Service, 1985-1988
Nursing Home and Home Visits

HCPCS	Description	1985 Total Allowed Services (in thousands)	1988 Total Allowed Services (in thousands)	Average Annual Growth	1985 Total Allowed Charges (in millions)	1988 Total Allowed Charges (in millions)	Average Annual Growth
90450	Nursing home, boarding home, domiciliary, or custodial care medical service, established patient; limited service	2170.7	2427.0	3.79%	$42.2	$54.2	8.71%
90350	Subsequent care, SNF, ICF, or LTC; limited service	1603.7	1892.5	5.68%	32.3	44.8	11.53%
90360	Subsequent care, SNF, ICF, or LTC; intermediate service	1326.3	2147.3	17.42%	31.0	58.4	23.48%
90460	Nursing home, boarding home, domiciliary, or custodial care medical service, established patient; intermediate service	844.0	1144.7	10.69%	19.1	28.8	14.70%
90440	Nursing home, boarding home, domiciliary, or custodial care medical service, established patient; brief service	1132.3	895.7	-7.52%	17.2	15.2	-4.15%
90160	Home medical service, established patient; intermediate service	543.5	533.3	-0.63%	17.0	20.7	6.80%
90150	Home medical service, established patient; limited service	576.3	405.9	-11.03%	15.6	13.1	-5.61%
90340	Subsequent care, SNF, ICF, or LTC; brief service	930.1	934.6	0.16%	15.5	18.3	5.76%
90370	Subsequent care, SNF, ICF, or LTC; extended service	362.7	522.8	12.96%	10.4	17.6	19.10%
90320	Initial care, SNF, ICF, or LTC; comprehensive history and physical examination, initiation of diagnostic and treatment programs, and preparation of hospital records	186.4	273.7	13.65%	9.4	16.4	20.52%
90170	Home medical service, established patient; extended service	212.6	232.8	3.07%	7.6	10.1	10.09%
90470	Nursing home, boarding home, domiciliary, or custodial care medical service, established patient; extended service	257.9	305.7	5.83%	7.2	9.5	9.77%
90315	Initial care, SNF, ICF, or LTC; intermediate history and physical examination, initiation of diagnostic and treatment programs, and preparation of hospital records	163.8	157.9	-1.22%	5.7	6.0	1.66%
90140	Home medical service, established patient; brief service	232.7	142.1	-15.15%	5.6	4.2	-9.11%
90420	Nursing home, boarding home, domiciliary, or custodial care medical service, new patient; comprehensive service	107.5	116.4	2.70%	4.7	6.0	8.60%
	Other Nursing Home and Home Visits	799.2	1412.5	20.91%	24.2	41.1	19.34%
	All Nursing Home and Home Visits	11449.6	13544.6	5.76%	264.5	364.3	11.25%

SOURCE: Tabulations from the 1985 and 1988 BMAD procedure files.

Table 8
Growth in Services and Allowed Charges for Individual Procedures, by Type of Service, 1985-1988
Specialty-Specific Evaluation and Management Services

HCPCS	Description	1985 Total Allowed Services (in thousands)	1988 Total Allowed Services (in thousands)	Average Annual Growth	1985 Total Allowed Charges (in millions)	1988 Total Allowed Charges (in millions)	Average Annual Growth
92014	Ophthalmological services: medical examination; comprehensive, established patient, one or more visits	2500.6	4496.9	21.61%	$85.0	$180.1	28.45%
90844	Individual medical psychotherapy by a physician; approximately 45 to 50 minutes	1755.4	1975.6	4.02%	70.7	107.0	14.82%
92012	Ophthalmological services: medical examination and evaluation with initiation or continuation of diagnostic and treatment program; intermediate, established patient	2269.6	4324.6	23.97%	66.8	135.6	26.63%
88304	Surgical pathology, gross and microscopic examination of presumptively abnormal tissue(s); uncomplicated specimen	2060.0	2877.8	11.79%	62.7	103.3	18.11%
88305	Surgical pathology, gross and microscopic examination of presumptively abnormal tissue(s); single complicated or multiple uncomplicated specimen(s) without complex dissection	1088.2	1700.9	16.05%	50.0	100.3	26.10%
90843	Individual medical psychotherapy by a physician; approximately 20 to 30 minutes	1603.2	1974.2	7.18%	45.6	58.8	8.86%
92004	Ophthalmological services: medical examination and evaluation with initiation of diagnostic and treatment program; comprehensive, new patient, one or more visits	1037.1	1689.7	17.67%	40.4	71.1	20.72%
92235	Ophthalmoscopy, with medical diagnostic evaluation; with flourescein angiography (includes multiframe photography)	232.3	366.5	16.42%	26.4	47.8	21.91%
88307	Surgical pathology, gross and microscopic examination of presumptively abnormal tissue(s); single complicated specimen requiring complex dissection or multiple complicated specimens	363.5	524.5	13.00%	23.3	43.2	22.80%
90841	Individual medical psychotherapy by a physician; time unspecified	729.0	882.4	6.58%	18.6	31.0	18.55%
88302	Surgical pathology, gross and microscopic examination of presumptively abnormal tissue(s), for identification and record purposes	743.9	535.5	-10.38%	18.3	14.9	-6.60%
88309	Surgical pathology, gross and microscopic examination of presumptively abnormal tissue(s); complex diagnostic problem with or without extensive dissection	191.9	269.4	11.97%	16.5	30.5	22.83%
92002	Ophthalmological services: medical examination and evaluation with initiation of diagnostic and treatment program; intermediate, new patient	506.3	453.0	-3.63%	16.1	15.9	-0.40%
88331	Consultation during surgery; with frozen section(s), single specimen	262.7	360.9	11.17%	12.9	27.6	28.94%
92225	Ophthalmoscopy, extended as for retinal detachment (may include use of contact lens, drawing or sketch, and/or fundus biomicroscopy), with medical diagnosis evaluation; initial	302.0	650.0	29.12%	12.9	27.8	29.19%
92286	Special anterior segment photography with medical diagnostic evaluation; with specular endothelial microscopy and cell count	88.4	211.5	33.76%	6.1	22.7	54.68%

(Continued)

Table 8 (Continued)
Growth in Services and Allowed Charges for Individual Procedures, by Type of Service, 1985-1988
Specialty-Specific Evaluation and Management Services

HCPCS	Description	1985 Total Allowed Services (in thousands)	1988 Total Allowed Services (in thousands)	Average Annual Growth	1985 Total Allowed Charges (in millions)	1988 Total Allowed Charges (in millions)	Average Annual Growth
92083	Visual field examination with medical diagnostic evaluation; extended examination, quantitative perimetry (eg, manual static and kinetic perimetry on Goldmann or Tubingen perimeter or equivalent, or automated static perimetry, complex, such as Octopus program 31 + 41, or 32 + 41)	130.7	575.9	63.92%	5.3	34.9	87.89%
	Other Specialist Evaluation and Management Services	6240.5	9100.9	13.40%	114.1	201.5	20.87%
	All Specialist Evaluation and Management Services	22105.3	32970.3	14.26%	691.6	1254.0	21.94%

SOURCE: Tabulations from the 1985 and 1988 BMAD procedure files.

Table 9
Growth in Services and Allowed Charges for Individual Procedures, by Type of Service, 1985-1988
Consultations

HCPCS	Description	1985 Total Allowed Services (in thousands)	1988 Total Allowed Services (in thousands)	Average Annual Growth	1985 Total Allowed Charges (in millions)	1988 Total Allowed Charges (in millions)	Average Annual Growth
90620	Initial consultation; comprehensive	4018.9	5196.1	8.94%	$333.4	$489.9	13.69%
90630	Initial consultation; complex	922.5	1310.5	12.41%	97.3	161.9	18.49%
90610	Initial consultation; extended	1080.5	1112.5	0.98%	67.5	77.6	4.75%
90600	Initial consultation; limited	1045.3	841.7	-6.96%	49.8	44.4	-3.81%
90605	Initial consultation; intermediate	713.6	921.9	8.91%	35.1	50.3	12.70%
90642	Follow-up consultation; intermediate visit, evaluation and/or treatment	888.1	1141.3	8.72%	30.4	44.4	13.39%
90643	Follow-up consultation; extended visit	385.1	508.9	9.73%	18.5	26.7	13.16%
90641	Follow-up consultation; limited visit	401.9	586.5	13.43%	10.6	16.6	16.12%
	Other Consultations	308.2	408.3	9.83%	11.7	17.5	14.38%
	All Consultations	9764.2	12027.9	7.20%	654.3	929.2	12.40%

SOURCE: Tabulations from the 1985 and 1988 BMAD procedure files.

Table 10
Growth in Services and Allowed Charges for Individual Procedures, by Type of Service, 1985-1988
Major Procedures - Other

HCPCS	Description	1985 Total Allowed Services (in thousands)	1988 Total Allowed Services (in thousands)	Average Annual Growth	1985 Total Allowed Charges (in millions)	1988 Total Allowed Charges (in millions)	Average Annual Growth
52601	Transurethral resection of prostate, including control of postoperative bleeding, complete (vasectomy, meatotomy, cystourethroscopy, urethral calibration and/or dilation, and internal urethrotomy are included)	218.1	225.9	1.17%	$229.0	$254.8	3.62%
44140	Colectomy, partial; with anastomosis	63.0	63.9	0.48%	71.9	79.3	3.31%
47605	Cholecystectomy; with cholangiography	57.1	71.1	7.58%	48.4	66.0	10.92%
19240	Mastectomy, modified radical, including axillary lymph nodes but leaving pectoral muscles	36.9	50.3	10.92%	34.9	52.1	14.31%
47600	Cholecystectomy;	45.9	43.6	-1.68%	34.5	35.2	0.68%
66820	Discission of secondary membraneous cataract ("after cataract") and/or anterior hyaloid; incisional technique (Ziegler or Wheeler Knife)	73.7	16.8	-38.96%	26.1	7.0	-35.62%
58150	Total hysterectomy (corpus and cervix), with or without removal of tube(s), with or without removal of ovary(s);	27.8	29.5	1.97%	25.2	29.0	4.83%
47610	Cholecystectomy with exploration of common duct;	26.5	27.3	0.92%	25.1	28.9	4.84%
32480	Lobectomy, total or segmental;	13.0	14.0	2.39%	20.1	23.8	5.72%
44120	Enterectomy, resection of small intestine; with anastomosis	20.6	23.3	4.20%	18.9	23.0	6.72%
44145	Colectomy, partial; with coloproctostomy (low pelvic anastomosis)	12.8	15.6	6.72%	17.3	23.4	10.61%
	Other Major Procedures - Other	1436.6	1614.5	3.97%	783.4	986.8	8.00%
	All Major Procedures - Other	2032.2	2195.8	2.61%	1334.8	1609.3	6.43%

SOURCE: Tabulations from the 1985 and 1988 BMAD procedure files.

Table 11
Growth in Services and Allowed Charges for Individual Procedures, by Type of Service, 1985-1988
Major Procedures - Cardiovascular

HCPCS	Description	1985 Total Allowed Services (in thousands)	1988 Total Allowed Services (in thousands)	Average Annual Growth	1985 Total Allowed Charges (in millions)	1988 Total Allowed Charges (in millions)	Average Annual Growth
33512	Coronary artery bypass, autogenous graft (e.g. saphenous vein or internal mammary artery); three coronary arteries	26.2	38.9	14.04%	$91.9	$153.8	18.74%
35301	Thromboendarterectomy, with or without patch graft; carotid, vertebral, subclavian, by neck incision	61.9	47.7	-8.30%	91.9	79.2	-4.83%
33513	Coronary artery bypass, autogenous graft (e.g. saphenous vein or internal mammary artery); four coronary arteries	21.2	32.2	15.08%	80.4	135.6	19.02%
33511	Coronary artery bypass, autogenous graft (e.g. saphenous vein or internal mammary artery); two coronary arteries	13.7	18.4	10.49%	41.9	65.7	16.14%
33514	Coronary artery bypass, autogenous graft, (eg, saphenous vein or internal mammary artery); five coronary grafts	8.6	12.3	12.89%	34.2	53.7	16.20%
35081	Direct repair of aneurysm or excision (partial or total) and graft insertion, with or without patch graft; for aneurysm or occlusive disease, abdominal aorta	16.0	16.0	0.06%	32.6	37.0	4.38%
33207	Insertion of permanent pacemaker with transvenous electrode(s); ventricular	31.9	43.7	11.04%	30.8	46.8	14.94%
93503	Right heart catheterization, placement of flow directed catheter (e.g. Swan-Ganz) with or without balloon tip, when placed for monitoring purposes, collection of blood, and or angiography	117.5	137.0	5.25%	29.7	42.7	12.85%
35556	Bypass graft, with vein; femoral-popliteal	16.0	11.5	-10.48%	24.6	20.5	-5.96%
33405	Replacement, aortic valve, with cardiopulmonary bypass	7.9	11.5	13.30%	21.2	33.2	16.19%
33206	Insertion of permanent pacemaker with transvenous electrode(s); atrial	22.9	11.8	-19.91%	21.0	11.6	-18.04%
33210	Insertion of temporary transvenous cardiac electrode, or pacemaker catheter (separate procedure)	76.0	68.4	-3.47%	20.5	23.6	4.84%
35656	Bypass graft, with other than vein; femoral-popliteal	11.7	14.4	7.22%	18.2	24.2	10.08%
36830	Creation of arteriovenous fistula; nonautogenous graft	18.9	28.3	14.49%	18.1	31.8	20.68%
92982	Percutaneous transluminal coronary angioplasty; single vessel	21.0	66.8	47.09%	17.7	99.2	77.60%
33208	Insertion of permanent pacemaker with transvenous electrode(s); AV sequential	13.2	17.2	9.04%	15.6	23.0	13.73%
36489	Placement of central venous catheter (subclavian, jugular or other vein) (eg, for central venous pressure, hyper-alimentation, hemodialysis, or chemotherapy); percutaneous, over age 2	53.2	204.3	56.65%	4.7	24.2	72.52%
	Other Major Procedures - Cardiovascular	889.7	1043.8	5.47%	413.2	569.8	11.30%
	All Major Procedures - Cardiovascular	1427.4	1824.3	8.52%	1008.3	1475.6	13.54%

SOURCE: Tabulations from the 1985 and 1988 BMAD procedure files.

Table 12
Growth in Services and Allowed Charges for Individual Procedures, by Type of Service, 1985–1988
Major Procedures - Orthopedic

HCPCS	Description	1985 Total Allowed Services (in thousands)	1988 Total Allowed Services (in thousands)	Average Annual Growth	1985 Total Allowed Charges (in millions)	1988 Total Allowed Charges (in millions)	Average Annual Growth
27130	Arthroplasty, acetabular and proximal femoral prosthetic replacement (total hip replacement); simple	50.8	61.6	6.68%	$113.9	$149.2	9.43%
27447	Arthroplasty, knee, condyle and plateau; medial AND lateral compartments with or without patella resurfacing (total knee replacement)	44.6	70.4	16.43%	96.9	160.3	18.25%
27244	Open treatment of closed or open intertrochanteric, pertrochanteric, or subtrochanteric femoral fracture, with internal fixation	80.7	89.1	3.37%	91.2	109.6	6.31%
27236	Open treatment of closed or open femoral fracture, proximal end, neck, internal fixation or prosthetic replacement	61.2	54.0	-4.10%	70.8	68.4	-1.14%
27131	Arthroplasty, acetabular and proximal femoral prosthetic replacement (total hip replacement), complex	10.3		-100.00%	23.6		-100.00%
27125	Hemiarthroplasty of hip (partial hip replacement)	12.8	21.7	19.25%	17.4	34.0	25.15%
27590	Amputation, thigh, through femur, any level;	20.9	22.3	2.24%	15.6	18.8	6.47%
27135	Secondary reconstruction or revision of arthroplasty, any type	6.4		-100.00%	14.3		-100.00%
27880	Amputation, leg, through tibia and fibula;	19.3	18.6	-1.16%	13.3	14.2	2.30%
27235	Treatment of closed or open femoral fracture, proximal end, neck, in situ pinning of undisplaced or impacted fracture	11.2	9.6	-5.05%	12.7	11.9	-2.09%
27134	Revision of total hip arthroplasty; both components		7.3			22.2	
27132	Conversion of previous hip surgery to total hip replacement		5.1			13.3	
	Other Major Procedures - Orthopedic	228.3	290.2	8.33%	197.7	286.9	13.22%
	All Major Procedures - Orthopedic	546.4	637.5	5.27%	667.2	853.4	8.55%

SOURCE: Tabulations from the 1985 and 1988 BMAD procedure files.

Table 13
Growth in Services and Allowed Charges for Individual Procedures, by Type of Service, 1985-1988
Ambulatory Procedures - Other

HCPCS	Description	1985 Total Allowed Services (in thousands)	1988 Total Allowed Services (in thousands)	Average Annual Growth	1985 Total Allowed Charges (in millions)	1988 Total Allowed Charges (in millions)	Average Annual Growth
49505	Repair inguinal hernia, age 5 or over;	91.4	104.6	4.60%	$45.9	$58.1	8.15%
11642	Excision, malignant lesion, face, ears, eyelids, nose, lips; lesion diameter 1.0 to 2.0 cm	139.2	165.1	5.84%	24.9	33.3	10.18%
11750	Excision of nail and nail matrix, partial or complete (e.g. ingrown or deformed nail) for permanent removal;	183.4	231.2	8.03%	22.5	32.8	13.51%
11641	Excision, malignant lesion, face, ears, eyelids, nose, lips, lesion diameter 0.5 to 1.0 cm	132.4	158.5	6.18%	18.8	25.7	11.12%
64721	Neuroplasty and/or transposition, median nerve at carpal tunnel	40.7	54.7	10.36%	18.3	26.0	12.41%
19120	Excision of cyst, fibroadenoma, or other benign tumor, aberrant breast tissue, duct lesion or nipple lesion (except 19140), male or female, one or more lesions	56.6	104.2	22.59%	14.4	30.0	27.61%
49560	Repair ventral (incisional) hernia (separate procedure)	23.9	29.4	7.18%	14.3	19.0	9.92%
58120	Dilation and curettage, diagnostic and/or therapeutic (nonobstetrical)	49.7	54.0	2.82%	12.2	13.8	4.02%
28285	Hammertoe operation; one toe (eg, interphalangeal fusion, filleting, phalangectomy)	46.3	63.8	11.24%	11.6	16.2	11.64%
28292	Hallux valgus (bunion) correction, with or without sesamoid-ectomy; Keller, McBride or Mayo type procedure	22.4	23.7	1.97%	11.5	13.4	5.19%
14060	Adjacent tissue transfer or rearrangement, eyelids, nose, ears and/or lips; defect 10 sq cm or less	18.7		-100.00%	9.5	16.7	20.92%
50590	Lithotripsy, extracorporeal shock wave		19.1			18.0	
	Other Ambulatory Procedures - Other	3493.9	4091.8	5.41%	488.6	657.5	10.40%
	All Ambulatory Procedures - Other	4298.6	5081.0	5.73%	692.5	942.5	10.82%

SOURCE: Tabulations from the 1985 and 1988 BMAD procedure files.

Table 14
Growth in Individual Procedures by Type of Service, 1985-1988
Ambulatory Procedures - Eye

HCPCS	Description	1985 Total Allowed Services (in thousands)	1988 Total Allowed Services (in thousands)	Average Annual Growth	1985 Total Allowed Charges (in millions)	1988 Total Allowed Charges (in millions)	Average Annual Growth
66984	Extracapsular cataract removal with insertion of intraocular lens prosthesis (one-stage procedure)	421.3	983.7	32.66%	673.2	1529.4	31.46%
66983	Intracapsular cataract extraction with insertion of intraocular lens prosthesis (one-stage procedure)	217.4	38.1	-44.04%	327.8	58.8	-43.61%
67228	Destruction of extensive or progressive retinopathy (eg, diabetic retinopathy), one or more sessions; photocoagulation (laser or xenon arc)	69.3	115.9	18.71%	45.7	90.8	25.75%
66985	Insertion of intraocular lens subsequent to cataract removal (separate procedure)	38.1	35.8	-2.05%	36.6	34.7	-1.75%
66920	Extraction of lens with or without iridectomy; intracapsular, with or without enzymes	22.7	2.7	-51.08%	25.0	2.8	-51.84%
65855	Trabeculoplasty by laser surgery, one or more sessions	35.5	92.1	37.44%	23.6	78.5	49.37%
66170	Fistulization of sclera for glaucoma; trabeculectomy ab externo	26.3	29.8	4.23%	22.7	25.4	3.77%
67107	Repair of retinal detachment, one or more sessions, same hospitalization; scleral buckling (such as lamellar excision, imbrication or encircling procedure) with or without implant may include procedures 67101, 67105	14.6	14.6	0.09%	21.4	24.9	5.16%
67210	Destruction of localized lesion of retina (eg, maculopathy, choroidopathy, small tumors), one or more sessions; photocoagulation (laser or xenon arc)	18.1	52.7	42.82%	10.4	40.3	57.01%
66821	Discussion of secondary membraneous cataract ('after cataract') and/or anterior hyaloid; laser surgery (one or more stages)	9.4	374.6	241.57%	4.5	192.2	250.33%
	Other Ambulatory Procedures - Eye	322.7	369.9	4.65%	318.6	309.0	-1.01%
	All Ambulatory Procedures - Eye	1195.4	2109.9	20.85%	1509.5	2386.7	16.50%

SOURCE: Tabulations from the 1985 and 1988 BMAD procedure files.

Table 15
Growth in Services and Allowed Charges for Individual Procedures, by Type of Service, 1985-1988
Minor Procedures

HCPCS	Description	1985 Total Allowed Services (in thousands)	1988 Total Allowed Services (in thousands)	Average Annual Growth	1985 Total Allowed Charges (in millions)	1988 Total Allowed Charges (in millions)	Average Annual Growth
20610	Arthrocentesis, aspiration and/or injection; major joint or bursa (e.g., shoulder, hip, knee joint, subacromial bursa)	1014.9	1285.0	8.18%	$27.8	$40.0	12.82%
17000	Destruction by any method, with or without surgical curettement, all facial lesions or premalignant lesions in any location, including local anesthesia; one lesion	900.8	1432.9	16.73%	27.4	47.8	20.47%
11100	Biopsy of skin, subcutaneous tissue and/or mucous membrane (including simple closure), unless otherwise listed (separate procedure); one lesion	493.7	640.2	9.05%	18.5	27.5	14.19%
11730	Avulsion of nail plate, partial or complete, simple; single	596.1	766.5	8.74%	16.9	24.5	13.30%
11710	Debridement of nails, electric grinder; five or less	688.9	830.4	6.42%	14.1	18.5	9.62%
11700	Debridement of nails, manual; five or less	708.6	1192.3	18.94%	13.6	26.8	25.47%
17100	Destruction by any method of benign skin lesions on any area	522.9	679.8	9.14%	12.6	18.4	13.31%
11000	Debridement of extensive eczematous or infected skin; up to 10% of body surface	421.6	534.0	8.20%	11.6	17.3	14.25%
97110	Physical medicine treatment to one area, initial 30 minutes, each visit; therapeutic exercises	754.5	796.2	1.81%	11.5	16.3	12.34%
10060	Incision and drainage of abscess (e.g., carbuncle, suppurative hidradenitis, and other cutaneous or subcutaneous abscesses); simple	358.5	395.5	3.32%	10.7	12.9	6.46%
17001	Destruction by any method, with or without surgical curettement, all facial lesions or premalignant lesions in any location, including local anesthesia; second and third lesions, each	565.6	1252.4	30.34%	9.2	19.9	29.43%
20550	Injection, tendon sheath, ligament, trigger points or ganglion cyst	360.6	521.7	13.11%	8.5	13.5	16.67%
10100	Incision and drainage of onychia or paronychia; single or simple	344.3	374.8	2.87%	8.3	12.4	14.11%
20600	Arthrocentesis, aspiration and/or injection; small joint, bursa, or ganglion cyst (e.g., fingers, toes)	289.2	296.1	0.78%	8.2	10.3	7.96%
28160	Hemiphalangectomy or interphalangeal joint excision, toe, single each	13.9	10.4	-9.07%	8.0	2.3	-33.99%
95861	Electromyography, two extremities and related paraspinal areas	77.9	109.4	11.99%	6.9	12.1	20.75%
14040	Adajent tissue transfer or rearrangement forehead, cheecks, chin, mouth, neck axillal, genitalia, hands and/or feet; defect 10 cm or less	15.7	25.3	17.30%	6.6	12.4	23.15%
	Other Minor Procedures	11285.2	17915.7	16.66%	297.6	488.4	17.95%
	All Minor Procedures	19413.1	29058.7	14.39%	517.9	821.2	16.61%

SOURCE: Tabulations from the 1985 and 1988 BMAD procedure files.

Table 16
Growth in Services and Allowed Charges for Individual Procedures, by Type of Service, 1985-1988
Oncology Services

HCPCS	Description	1985 Total Allowed Services (in thousands)	1988 Total Allowed Services (in thousands)	Average Annual Growth	1985 Total Allowed Charges (in millions)	1988 Total Allowed Charges (in millions)	Average Annual Growth
77405	Daily megavoltage treatment management; intermediate	1511.9	1271.9	-5.60%	56.7	62.6	3.38%
77410	Daily megavoltage treatment management; complex	1130.5	1389.7	7.12%	51.9	88.2	19.34%
77400	Daily megavoltage treatment management; simple	1137.3	793.9	-11.29%	32.9	29.0	-4.06%
77263	Therapeutic radiology treatment planning; complex	69.0	88.8	8.77%	12.0	23.4	25.01%
77262	Therapeutic radiology treatment planning; intermediate	85.3	86.5	0.49%	11.1	15.5	11.75%
77261	Therapeutic radiology treatment planning; simple	117.2	91.3	-7.98%	10.0	11.4	4.64%
96500	Chemotherapy injection, intravenous, single premixed agent administered by qualified assistant under supervision of physician or by physician, by push technique	377.5	390.7	1.15%	8.2	11.3	10.97%
90862	Chemotherapy management, including prescription, use, and review of medication with no more than minimal medical psychotherapy	279.8	511.7	22.29%	7.5	12.8	19.79%
77300	Basic radiation dosimetry calculation, central axis depth dose, TDF, NSD, gap calculation, off axis factor, tissue inhomogeneity factors, as required during course of treatment	126.0	181.1	12.84%	6.7	11.6	19.99%
77430	Weekly megavoltage treatment management; complex	35.7	137.0	56.57%	6.1	28.1	66.65%
77415	Therapeutic radiology treatment port film interpretation and verification, per treatment course	334.9	596.3	21.20%	5.7	12.2	28.82%
96508	Chemotherapy injection, intravenous, complex, using one or more agents requiring mixing, administered by qualified assistant under supervision of physician or by physician, by push technique	171.2	192.2	3.94%	4.9	6.9	11.85%
77334	Treatment devices, design and construction; complex (irregular blocks, special shields, compensators, wedges, molds or casts)	65.7	65.3	-0.18%	4.7	9.1	24.69%
77290	Therapeutic radiology simulation-aided field setting; complex	47.0	84.7	21.71%	4.4	11.3	37.24%
77285	Therapeutic radiology simulation-aided field setting; intermediate	55.0	82.8	14.57%	3.8	7.7	26.41%
77315	Teletherapy, isodose plan (whether hand or computer calculated); complex (mantle or inverted Y, tangential ports, the use of wedges, compensators, complex rotational blocking or special beam considerations)	38.0	56.1	13.89%	3.2	7.2	31.28%
96510	Chemotherapy injection, intravenous, complex using one or more agents requiring mixing, administered by qualified assistant under supervision of physician or by physician; by infusion technique, prolonged, requiring attendance up to one hour	74.5	194.0	37.59%	3.1	10.2	49.11%
	Other Oncology Services	1175.4	1648.9	11.94%	54.4	96.2	20.92%
	All Oncology Services	6832.0	7862.9	4.80%	287.2	454.8	16.56%

SOURCE: Tabulations from the 1985 and 1988 BMAD procedure files.

Table 17
Growth in Services and Allowed Charges for Individual Procedures, by Type of Service, 1985-1988
Endoscopy Procedures

HCPCS	Description	1985 Total Allowed Services (in thousands)	1988 Total Allowed Services (in thousands)	Average Annual Growth	1985 Total Allowed Charges (in millions)	1988 Total Allowed Charges (in millions)	Average Annual Growth
43235	Upper gastrointestinal endoscopy including esophagus, stomach and either the duodenum and/or jejunum as appropriate; complex diagnostic	347.9	501.6	12.98%	95.2	149.8	16.31%
45378	Colonoscopy, fiberoptic, beyond splenic flexure; diagnostic procedure	205.9	397.4	24.50%	76.6	167.6	29.83%
43239	Upper gastrointestinal endoscopy including esophagus, stomach and either the duodenum and/or jejunum as appropriate; for biopsy and/or collection of specimen by brushing or washing	202.7	305.2	14.61%	64.7	104.7	17.42%
45385	Colonoscopy, fiberoptic, beyond splenic flexure; for removal of polypoid lesion(s)	108.7	218.3	26.16%	63.9	143.7	31.02%
52000	Cystourethroscopy (separate procedure)	442.7	609.2	11.23%	40.2	67.8	19.01%
45360	Colonoscopy, fiberoptic, beyond 25 cm to splenic flexure, diagnostic procedure	208.9	18.0	-55.86%	39.5	3.5	-55.35%
45380	Colonoscopy, fiberoptic, beyond splenic flexure; for biopsy and/or collection of specimen by brushing or washing	80.6	147.4	22.27%	34.0	69.8	27.13%
45330	Sigmoidoscopy, flexible fiberoptic; diagnostic	355.6	767.3	29.22%	29.3	74.9	36.71%
45300	Proctosigmoidoscopy; diagnostic (separate procedure)	614.5	376.1	-15.10%	23.9	16.4	-11.83%
31626	Bronchoscopy, with biopsy, fiberoptic bronchoscope	64.5		-100.00%	20.0		-100.00%
52240	Cystourethroscopy, with fulguration (including cryosurgery or laser surgery) and/or resection of; large bladder tumor(s)	19.0	20.4	2.48%	14.6	18.4	8.15%
52235	Cystourethroscopy, with fulguration (including cryosurgery or laser surgery) and/or resection of; medium bladder tumor(s)	20.5	22.2	2.78%	12.5	14.9	6.24%
31621	Bronchoscopy, diagnostic, fiberoptic bronchoscope	50.1		-100.00%	12.2		-100.00%
43260	Endoscopic retrograde cholangiopancreatography (ERCP), with or without specimen collection;	27.7	36.7	9.73%	11.6	17.5	14.83%
52281	Cystourethroscopy, with calibration and/or dilation of urethral stricture or stenosis, with or without meatotomy and injection procedure for cystography, male or female	50.8	97.4	24.22%	8.3	18.7	31.09%
29881	Arthroscopy, knee, surgical; for infection, lavage and drainage with meniscectomy (medical or lateral including any meniscal shaving)	8.8	25.0	41.49%	7.9	25.2	47.41%
31625	Bronchoscopy; with biopsy cell washing or brushing	15.3	71.5	67.27%	4.2	22.8	75.82%
31622	Bronchoscopy; diagnostic, (flexible or rigid) with or without		104.7			30.4	
	Other Endoscopy Procedures	1061.9	1339.6	8.05%	201.1	312.9	15.87%
	All Endoscopy Procedures	3886.2	4953.4	8.42%	759.5	1228.8	17.40%

SOURCE: Tabulations from the 1985 and 1988 BMAD procedure files.

Table 18
Growth in Services and Allowed Charges for Individual Procedures, by Type of Service, 1985-1988
Standard Imaging

HCPCS	Description	1985 Total Allowed Services (in thousands)	1988 Total Allowed Services (in thousands)	Average Annual Growth	1985 Total Allowed Charges (in millions)	1988 Total Allowed Charges (in millions)	Average Annual Growth
71020	Radiologic examination, chest, two views, frontal and lateral (G)	3734.2	4343.3	5.17%	129.1	166.1	8.76%
71020	Radiologic examination, chest, two views, frontal and lateral (PC)	8620.9	10348.5	6.28%	115.4	157.5	10.92%
71010	Radiologic examination, chest; single view, frontal (PC)	8480.9	10348.5	6.86%	87.1	127.3	13.49%
71010	Radiologic examination, chest; single view, frontal (G)	1424.3	1166.8	-6.43%	35.5	36.1	0.50%
78306	Bone imaging; whole body (PC)	481.5	633.5	9.58%	30.2	44.9	14.13%
74270	Radiologic examination, colon; barium enema (PC)	790.5	648.6	-6.38%	22.9	21.0	-2.85%
76091	Mammography; bilateral (G)	286.8	988.4	51.05%	20.6	78.0	55.90%
72110	Radiologic examination, spine; lumbosacral (G)	314.1	363.8	5.02%	19.0	25.0	9.63%
73510	Radiologic examination, hip (G)	494.6	608.8	7.17%	18.5	25.8	11.81%
74240	Radiologic examination, gastrointestinal tract; upper, with or without delayed films, without KUB (PC)	600.9	478.6	-7.30%	18.1	16.1	-3.80%
76091	Mammography; bilateral (PC)	407.4	1112.9	39.79%	11.3	34.5	45.22%
	Other Standard Imaging	22362.8	25049.7	3.85%	650.5	850.5	9.35%
	All Standard Imaging	47998.8	56091.6	5.33%	1158.2	1582.9	10.97%

SOURCE: Tabulations from the 1985 and 1988 BMAD procedure files.

Table 19
Growth in Individual Procedures by Type of Service, 1985-1988
Advanced Imaging

HCPCS	Description	1985 Total Allowed Services (in thousands)	1988 Total Allowed Services (in thousands)	Average Annual Growth	1985 Total Allowed Charges (in millions)	1988 Total Allowed Charges (in millions)	Average Annual Growth
70470	Computerized axial tomography, head or brain; w/o contrast material, followed by contrast material(s) and further sections (PC)	588.7	627.6	2.16%	52.5	71.6	10.93%
70450	Computerized axial tomography, head or brain; w/o contrast material (PC)	564.4	924.8	17.89%	41.9	85.5	26.81%
74160	Computerized axial tomography, abdomen; with contrast material (PC)	300.0	499.3	18.52%	28.5	55.0	24.42%
70460	Computerized axial tomography, head or brain; with contrast material(s) (PC)	269.8	196.4	-10.04%	22.2	19.6	-4.11%
74170	Computerized axial tomography, abdomen; w/o contrast material, followed by contrast material(s) and further sections (PC)	162.8	261.0	17.04%	17.4	31.9	22.36%
70470	Computerized axial tomography, head or brain; w/o contrast material, followed by contrast material(s) and further sections (G)	67.5	65.8	-0.88%	16.3	24.7	14.93%
74150	Computerized axial tomography, abdomen; w/o contrast material (PC)	157.1	223.5	12.48%	13.4	22.5	18.82%
71260	Computerized axial tomography, thorax; with contrast material(s) (PC)	110.5	195.3	20.93%	10.9	21.9	26.26%
70450	Computerized axial tomography, head or brain; w/o contrast material (G)	41.7	55.0	9.64%	9.3	15.6	18.79%
72131	Computerized axial tomography, lumbar spine; w/o contrast material (PC)	110.3	181.6	18.08%	9.1	18.6	26.63%
74160	Computerized axial tomography, abdomen; with contrast material (G)	25.2	59.8	33.39%	7.6	22.5	43.74%
71250	Computerized axial tomography, thorax; w/o contrast material (PC)	84.6	139.2	18.04%	7.4	14.3	24.69%
70460	Computerized axial tomography, head or brain; with contrast material (G)	27.7	21.8	-7.70%	6.7	7.0	1.61%
72193	Computerized axial tomography, pelvis; with contrast material(s) (PC)	67.6	187.4	40.47%	6.4	19.6	45.17%
74170	Computerized axial tomography, abdomen; w/o contrast material, followed by contrast material(s) and further sections (G)	17.1	38.7	31.34%	5.9	16.2	39.85%
72131	Computerized axial tomography, lumbar spine; w/o contrast material (G)	19.2	44.9	32.71%	5.6	15.7	41.13%
70551	Magnetic resonance (eg,proton) imaging; orbit, face and neck (G)	1.0	83.3	343.94%	0.3	53.2	488.64%
70551	Magnetic resonance (eg,proton) imaging; orbit, face and neck (PG)	11.3	120.8	120.46%	0.1	17.9	427.35%
72141	Magnetic resonance (eg,proton) imaging, spinal canal and contents; cervical (G)		23.1			15.6	
72144	Magnetic resonance (eg,proton) imaging, spinal canal and contents; lumbar (G)		39.3			24.3	
	Other Advanced Imaging	787.1	884.3	3.96%	48.3	181.8	55.59%
	All Advanced Imaging	3413.3	4810.4	12.12%	309.8	715.0	32.16%

SOURCE: Tabulations from the 1985 and 1988 BMAD procedure files.

Table 20
Growth in Services and Allowed Charges for Individual Procedures, by Type of Service, 1985-1988
Sonographic Imaging

HCPCS	Description	1985 Total Allowed Services (in thousands)	1988 Total Allowed Services (in thousands)	Average Annual Growth	1985 Total Allowed Charges (in millions)	1988 Total Allowed Charges (in millions)	Average Annual Growth
76516	Ophthalmic biometry by ultrasound echography, A-mode	535.7	503.4	-2.05%	67.3	48.4	-10.39%
76700	Echography, abdominal, B-scan and/or real time with image documentation; complete	711.5	894.4	7.93%	43.5	68.2	16.16%
93870	Non-invasive studies of cartoid artery, imaging (eg, flow imaging by ultrasonic arteriography, high resolution B-scan with or without pulsed Doppler flow evaluation, Doppler flow or duplex scan with spectrum analysis)	355.3	740.1	27.71%	37.8	87.8	32.45%
93307	Echocardiography, real time with image documentation (2D), complete	323.0	391.1	6.59%	30.8	37.5	6.78%
76627	Echocardiography, real time with image documentation	253.5	197.8	-7.93%	24.2	20.0	-6.18%
93309	Echocardiography, M-mode and real time with image documentation	163.9	760.6	66.79%	21.5	116.0	75.28%
76620	Echocardiography, M-mode, complete	247.6	124.0	-20.59%	19.4	9.4	-21.37%
93300	Echocardiography, M-mode, complete	228.6	176.5	-8.27%	16.8	13.3	-7.59%
76770	Echography, retroperitoneal (e.g., renal, aorta, nodes), B-scan and/or real time with image documentation; complete	278.7	411.5	13.86%	16.3	28.4	20.30%
76705	Echography, abdominal, B-scan and/or real time with image documentation; limited (e.g., single organ, quadrant, follow-up) (PC)	270.4	424.1	16.19%	11.5	21.6	23.18%
76511	Ophthalmic ultrasound, echography; A-mode, special analysis with amplitude quantification (G)	98.6	89.6	-3.15%	10.6	8.1	-8.32%
76512	Ophthalmic ultrasound, echography; contact B-scan (G)	57.6	97.3	19.06%	7.7	16.1	27.94%
76629	Echocardiography, M-mode and real time with image documentation	59.0	349.8	80.98%	6.9	56.0	100.71%
76925	Echocardiography, peripheral vascular system (e.g., B-scan, doppler or real time)	78.3	116.2	14.05%	6.8	11.7	20.18%
76805	Echocardiography, pregnant uterus, B-scan and/or real time with image documentation	106.9	55.6	-19.56%	6.4	3.5	-18.05%
76856	Echography, pelvic (non-obstetric), B-scan and/or real time with image documentation; complete	60.7	227.1	55.21%	3.5	18.5	73.48%
76519	Opthalmic biometry by ultrasound echography, A-mode; with intraocular lens power calculation		440.7		2.2	42.5	168.29%
93320	Doppler echocardiography	9.6	443.2	258.33%	0.7	32.4	262.97%
76632	Doppler echocardiography	7.0	180.6	195.71%	0.5	15.5	215.56%
76991	Intraluminal ultrasound study (eg, transrectal, transvaginal)		76.4			10.7	
	Other Sonographic Imaging	366.3	451.5	7.22%	21.8	34.8	16.99%
	All Sonographic Imaging	4212.4	7075.0	18.87%	356.3	689.9	24.64%

SOURCE: Tabulations from the 1985 and 1988 BMAD procedure files.

Table 21
Growth in Services and Allowed Charges for Individual Procedures, by Type of Service, 1985-1988
Imaging Involving a Significant Procedure

HCPCS	Description	1985 Total Allowed Services (in thousands)	1988 Total Allowed Services (in thousands)	Average Annual Growth	1985 Total Allowed Charges (in millions)	1988 Total Allowed Charges (in millions)	Average Annual Growth
93547	Combined left heart catheterization, selective coronary angiography, and selective left ventricular angiography (PC)	120.2	228.2	23.84%	71.0	159.9	31.06%
93549	Combined right and left heart catheterization, selective coronary angiography, and selective left ventricular angiography	76.6	121.6	16.67%	59.0	110.3	23.19%
75631	Aortography, abdominal plus bilateral iliofemoral lower extremity, catheter, by serialography; complete procedure	32.2	53.4	18.38%	9.5	19.3	26.88%
75657	Angiography, cervicocerebral, selective catheter, including vessel origin; three or four vessels, complete procedure	25.1	23.5	-2.21%	8.8	10.3	5.54%
36200	Introduction of catheter, aorta (arch, abdominal, midstream renal, aortoiliac runoff)	39.3	46.2	5.48%	8.3	11.3	11.08%
75673	Angiography, carotid, cerebral, bilateral; catheter, complete procedure	24.1	20.6	-5.06%	7.2	8.1	3.67%
62284	Injection procedure for myelography and/or computerized axial tomography, spinal or posterior fossa	42.1	40.1	-1.59%	7.1	7.4	1.78%
36010	Introduction of catheter, in superior or inferior vena cava, right heart or pulmonary artery	40.0	43.6	2.94%	6.3	8.8	11.66%
75821	Venography, extremity, unilateral; complete procedure	58.1	86.1	14.03%	5.3	9.2	19.85%
93545	Injection procedure during cardiac catheterization; for selective coronary angiography (injection of radiopaque material may be by hand)	18.1	14.1	-8.12%	5.0	3.1	-14.83%
93548	Combined left heart catheterization, selective coronary angiography, selective left ventriculography, with aortic root aortography	7.4	13.9	23.30%	4.6	10.6	31.61%
75628	Aortography, abdominal, catheter, by serialography; complete procedure	18.8	24.7	9.46%	4.5	7.3	17.55%
93552	Combined left heart catheterization, selective coronary angiography, selective left ventricular cineangiography and visualization of bypass grafts		11.3			10.1	
	Other Imaging Involving a Significant Procedure	802.0	791.6	-0.43%	114.5	146.2	8.48%
	All Imaging Involving a Significant Procedure	1304.0	1507.6	4.96%	311.3	512.0	18.04%

SOURCE: Tabulations from the 1985 and 1988 BMAD procedure files.

Table 22
Growth in Services and Allowed Charges for Individual Procedures, by Type of Service, 1985-1988
Laboratory Tests

HCPCS	Description	1985 Total Allowed Services (in millions)	1988 Total Allowed Services (in millions)	Average Annual Growth	1985 Total Allowed Charges (in millions)	1988 Total Allowed Charges (in millions)	Average Annual Growth
80019	Automated multichannel test; 19 or more clinical chemistry tests	9.6	11.3	5.57%	$92.1	$134.2	13.38%
81000	Urinalysis; with microscopy	13.2	14.8	3.92%	66.5	71.5	2.41%
82947	Glucose; except urine (e.g., blood, spinal fluid, joint fluid)	7.1	7.6	2.12%	41.8	44.1	1.77%
85022	Blood count; hemogram, automated and differential WBC count (CBC)	4.4	4.3	-0.98%	38.2	36.1	-1.85%
85031	Blood count; hemogram, manual, complete CBC	3.6	2.5	-11.36%	29.4	22.2	-8.90%
82643	Digoxin, RIA	1.1	1.6	13.27%	21.6	32.1	14.16%
85610	Prothrombin time;	2.9	3.8	9.10%	18.3	23.0	8.06%
80016	Automated multichannel test; 13-16 clinical chemistry tests	1.1	1.2	1.90%	17.2	17.8	1.26%
84436	Thyroxine, true (TT-4), RIA	1.5	2.9	22.92%	16.4	27.6	18.85%
85021	Hemogram, automated (RBC, WBC, HgB, Hct and indices only	2.2	2.4	3.20%	15.8	19.4	7.01%
84132	Potassium; blood	2.4	2.5	1.39%	15.7	16.9	2.40%
80018	Automated, multichannel tests 17-18 clinical tests	0.9	1.1	5.87%	15.2	16.0	1.70%
87086	Culture, bacterial, urine; quantitative, colony count	1.3	1.9	13.83%	15.2	22.1	13.40%
85028	Hemogram and platelet counts, automated and manual differential WBC count	1.3		-100.00%	14.3		-100.00%
84443	Thyroid stimulating hormone (TSH), RIA or EIA	0.6	1.5	37.36%	14.3	38.2	38.65%
36415	Routine venipuncture for collection of specimen(s)	3.8	25.4	88.50%	11.6	76.5	87.34%
85025	Hemogram and platelet count, automated, and automated complete differential WBC count (CBC)		4.3			49.9	
83718	Lipoprotein high density cholesterol (HDL cholesterol) by precipitation method	0.6	3.1	73.58%	6.5	35.4	75.83%
83720	Lipoprotein cholesterol fractionation calculation by formula	0.0	2.0	334.49%	0.4	34.1	350.40%
85023	Hemogram and platelet count, automated, and automated partial differential WBC count (CBC)		1.9			22.5	
	Other Laboratory Tests	48.3	67.0	11.54%	424.9	686.1	17.32%
	All Laboratory Tests	106.1	163.2	15.42%	875.5	1425.8	17.65%

SOURCE: Tabulations from the 1985 and 1988 BMAD procedure files.

Table 23
Growth in Services and Allowed Charges for Individual Procedures, by Type of Service, 1985-1988
Other Tests

HCPCS	Description	1985 Total Allowed Services (in thousands)	1988 Total Allowed Services (in thousands)	Average Annual Growth	1985 Total Allowed Charges (in millions)	1988 Total Allowed Charges (in millions)	Average Annual Growth
93000	Electrocardiogram, routine ECG with at least 12 leads; with interpretation and report	8741.6	9287.4	2.04%	256.8	326.6	8.34%
93010	Electrocardiogram, routine ECG with at least 12 leads; interpretation and report only	11402.6	15686.8	11.22%	122.6	202.1	18.13%
93274	Electrocardiographic monitoring utilizing a system such as magnetic tape, 12 through 24 hours, includes recording, scanning analysis, interpretation and report	443.9		-100.00%	77.1		-100.00%
93015	Cardiovascular stress test using maximal or submaximal treadmill or bicycle exercise; continuous electrocardiographic monitoring, with interpretation and report	392.4	613.9	16.10%	45.0	79.8	21.00%
93277	Electrocardiographic monitoring utilizing a system such as magnetic tape 12 through 24 hours, physician review and interpretation, with report	376.4		-100.00%	20.7		-100.00%
93910	Non-invasive studies of lower extremity arteries (eg, segmental blood pressure measurements, continuous wave Doppler analog wave form analysis, evocative pressure response to exercise or reactive hypermia, photoplethysmography or pulse volume digit wave form analysis, flow velocity signals)	242.7	483.1	25.79%	19.3	45.7	33.34%
95819	Electroencephalogram (EEG), including recording awake, drowsy, and asleep, with hyperventilation and/or photic stimulation; standard or portable, same facility	383.2	475.2	7.44%	16.7	24.1	12.99%
95900	Nerve conduction, velocity and/or latency study; motor, each nerve	435.8	766.9	20.73%	14.4	26.5	22.50%
94010	Spirometry, including graphic record, total and timed vital capacity, expiratory flow rate measurement(s) and/or maximal voluntary ventilation	484.1	652.9	10.48%	12.9	21.0	17.54%
94060	Bronchospasm evaluation: spirometry as in 94010, before and after bronchodilator (aerosol or parenteral) or exercise	286.6	465.4	17.55%	12.8	24.0	23.38%
93860	Non-invasive studies of carotid arteries, non-imaging	154.8	214.5	11.50%	11.6	19.3	18.37%
93018	Cardiovascular stress test using maximal or submaximal treadmill or bicycle exercise; interpretation and report only	179.7	392.2	29.72%	9.4	27.1	42.00%
93736	Electronic analysis of single-chamber internal pacemaker system (may include rate, pulse amplitude and duration, configuration of wave form, and/or testing of sensory function of pacemaker); telephonic analysis		459.5			16.7	
93262	Electrocardiographic monitoring, 12 through 24 hours of continuous analog recording, with physician review, interpretation, and report, with or without full disclosure printout; with superimposition scanning		104.6			18.8	
Q0022	Electrocardiographic monitoring for 24 hours		401.9			24.7	
Q0019	Electrocardiographic monitoring for 24 hours		371.9			78.5	
	Other Other Tests	6300.4	9837.3	16.01%	148.0	392.6	38.42%
	All Other Tests	29824.1	38875.7	9.24%	767.5	1188.7	15.70%

SOURCE: Tabulations from the 1985 and 1988 BMAD procedure files.

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